

Determination of steel bar dispersed mass in electric discharge with alternative electrode

Shakirova G., Shakirov Y., Ilyin V., Valiev R., Drogaylova L.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© Published under licence by IOP Publishing Ltd. The mathematical model of plane problem of metal bar dispersion in electric discharge with liquid electrolyte is suggested in this research. The analogy with the plane problem of the theory of jets in an ideal fluid is used to solve the task. It actually means determination of analytic function in the field with one area of unknown boundary. The formula for determination of dispersed metal powder mass assuming the bar axial symmetry has been calculated.

<http://dx.doi.org/10.1088/1742-6596/789/1/012050>

References

- [1] Valiev R A, Gaisin F M and Shakirov Yu I 1991 Special traits of powder obtained in discharge between steel electrode and electrolyte Soviet Powder Metallurgy and Metal Ceramics 30 448-50
- [2] Valiev R A, Gaisin F M, Romanov E S and Shakirov Yu I 1991 Synthesis of iron oxide powders in a discharge with a liquid electrode Physics and chemistry of materials treatment 25 654-8
- [3] Sadikov K, Fayrushin I, Shamsutdinov A and Kashapov N 2016 Experimental setup for plasma treatment of disperse materials in the arc plasma jet J. of Phys.: Conf. Ser. 669 012048
- [4] Shakirov Y I, Valiev R I, Khafizov A A, Valiev R A and Khakimov R G 2016 Erosion of electrode metal in the electric discharge under the exposure of the electrolyte stream J. of Phys.: Conf. Ser. 669 012064
- [5] Khafizov A A, Shakirov Yu I, Valiev R A, Valiev R I and Khafizova G M 2016 Study of thermal and electrical parameters of workpieces during spray coating by electrolytic plasma jet J. of Phys.: Conf. Ser. 669 012030
- [6] Davydov A D and Kozak E 1990 Vysokoskorostnoe jelectrohimicheskoe formoobrazovanie (Moscow: Nauka)
- [7] Lavrentyev M A and Shabat B V 1987 Metody teorii funkcij kompleksnogo peremennogo (Moscow: Nauka)
- [8] Kotljarskiy L M and Minazetdinov N M 2003 Prikladnaya mehanika i tehicheskaya fizika 44 179-84
- [9] Gurevich M I 1979 Teoriya struj ideal'noj zhidkosti (Moscow: Nauka)
- [10] Janke E, Jemde F and Ljosh F 1977 Special'nye funkcii (Moscow: Nauka)